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Feedback from Bob Anthony

1 message

Nathan Schumaker <[redacted]> **Mon, May 17, 2010 at 12:42 PM**
To: Brendan White <Brendan_White@fws.gov>, Bruce Marcot <brucem@spiritone.com>
Cc: "Anthony, Robert G - FW" <robert.anthony@oregonstate.edu>, "[redacted]" <[redacted]>

Hello all,

I just got off the phone with Bob Anthony. We worked through parameterization loose ends and came up with some answers. You'll be happy to know that we didn't spoil all the fun by answering every question... Here's a summary of our conversation:

Reproduction

The measured fecundities are for all territorial nesting birds. We are presently setting nesting frequencies at 70% (even years) and 30% (odd years), which gives a 50% overall nesting frequency. The HexSim fecundities are being applied only to nesting birds, and therefore we are doubling them. We will generate HexSim observed fecundities by dividing numbers of offspring by numbers of territorial females (on a per-stage-class basis). This should give us values approximating the measured fecundities that Bob has provided.

The measured fecundities do not vary between even and odd years. The HexSim scenario captures this.

However, nesting rates and observed fecundities will change by province. This means that the fecundity values we are using in HexSim may need to vary with province as well. We will have to determine how important it is to capture this element. Its certainly doable.

Survival

The survival event (in HexSim) makes sense either before or after the adult movement events. Currently we have it set before adult movement. I may move it to after adult movement, as this puts it more into the winter season...

Survival is currently the only place where resource allocation enters into the model. We are currently basing resource allocation on the territory, not the home range. This should be changed. Resource allocation should be derived from the home range.

Range Size and Resources

Prey diversity is low in the north (mainly just flying squirrels) and high in the south (flying squirrels, red tree voles, wood rats). This prey diversity accounts significantly for the range size, and thus it is

meaningful to rescale the resource maps used as HexSim input to capture this stratification. If simulated owls in the north construct larger ranges because they need more hexagons to meet their resource targets, then this is mechanistically accurate.

We don't know enough about floaters to inform the floater preemption parameter. (Floater preemption determines what fraction of each territory can be robbed by floaters.) But we do believe that territories are pretty accurately defended. This argues for setting the floater preemption parameter to zero. Further, if resources are to be derived from explored areas, this gives floaters a chance to compete for resources with territorial owls. Explored hexagons outside of territories will be divided up between competing conspecifics, be they floaters or territorial birds.

Movement

Adults who give up a territory typically end up taking a nearby territory. So we should probably change the movement routines for stages 1-3 to reflect this. We might do so by having these owls simply explore over a large area, but not disperse... However, this may not be the case for stage 1-3 floaters who were never territory holders. For those birds, we might use the existing dispersal values. This is an area that needs more thought.

Stage 0 dispersers should be using multiple dispersal / exploration pairs. The overall dispersal distance should probably remain the same, but they should move until they reach good habitat, stop, explore, and then disperse again if they are unsuccessful. Birds might stay several months between these dispersal segments, but the dispersal distances in the Foresman et. al. monograph (I believe our source for HexSim's dispersal parameters) are for movement distances in a single year.

Its not clear how many dispersal / exploration pairs we should use. But many shorter movements would be more realistic than fewer longer movements (I believe...).

Stage 0 dispersers will move until they reach suitable (not necessarily ideal) breeding habitat. They will then evaluate whether this is part of another owls territory. Given the size of our hexagons (86.6 hectares), it will be very unlikely that even a single hexagon will be comprised entirely of old growth habitat. So the stopping condition should reflect some level of intermediate habitat quality. Presently we are using a value of 60 on a scale of 0-87. We may want to set the stopping threshold so that its based on a mean of several hexagons. Currently owls stop if they reach a single hexagon of score 60 or better.

Bob suggested that our proposed owl simulation should be written up in a more biological way (e.g. a life cycle with parameter values and behavior) and presented to Eric Forsman. I agree, and will be willing to take the first stab at creating such a figure...

Nathan

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